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we have $297a-7533b=135a-1701b$ or $a=36b$. But $a=3$ and therefore $b=\frac{1}{12}$.

Substituting these values and $y=21$ in the first equrtion $x=\frac{3}{4}$ making the width $1\frac{1}{2}$ inches.

PROBLEMS.

18. **Proposed by M. C. STEVENS, A. M., Professor of Mathematics, Purdue University, Lafayette, Indiana.**

Show generally that a system of confocal conics is self orthogonal. [From Johnson's Differential Equations.]

19. **Propoped by F. P. MATZ, M. Sc., Ph. D., Professor of Mathematics and Astronomy in New Windsor College, New Windsor, Maryland.**

A spherical shrapnel-shell moving in a practically horizontal direction with a constant velocity $V_1=1500$ feet per second and at a uniform height $h=\frac{1}{2}g$ feet, explodes *equably* scattering the inclosed balls and fragments with a uniform velocity $V_2=1200$ feet per second. Draw the curve bounding the *minimum surface on the earth* on which the inclosed balls and fragments of the shell have fallen.

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QUERIES AND INFORMATION.

Conducted by J. M. COLAW, Monterey, Va. All contributions to this department should be sent to him.

Definitions of a Fraction. A Query by "H. C. K."

Three views of what a fraction is are here given, with the request that every reader send the editor of this department a card stating his preference.

(A). A fraction is one or more of the equal parts into which "a unit" or anything is divided; as, $\frac{m}{n}$. When $m>n$, the fraction is called "improper".

(B). A fraction is a number of the equal parts of one or more like units or things. The fraction $\frac{m}{n}$ is proper whether $m>n$ or $m<n$.

(C). A fraction is any number of the equal parts into which anything is divided, less than the whole number of such parts. When $m=n$, $\frac{m}{n}$ is a unit. When $m>n$, $\frac{m}{n}$ is a mixed number in fractional form,—not a fraction at all, since we can not take m equal parts of a thing divided into only n parts.

"An Unreasonable Rule" Again. By Professor P. H. PHILBRICK.

Mr. Pratt fails to make out his case. He does show indeed that the rate of convergency in the vicinity of the parallel of 50° latitude is nearly one-fifth more than near the parallel of 40° latitude but no one, so far as I know,